Dr. D. Wehrhahn
Meßsysteme für die Qualitätssicherung

Datasheet LaserMicrometer LM28

General:

-	Operating voltage:	10V 26V
-	Current consumption @ 12V:	< 130 mA
-	Output OBJEKT_DETECT:	open collector, < 80 mA, active LOW
-	Interface:	RS232, TXD, RXD
-	Laser:	655nm laser class 1M
-	Housing:	Aluminum, black anodized, potential free
-	Housing dimensions (L x W x H):	136 mm x 86 mm x 22 mm (see Appendix `C´)
-	Weight:	270g
-	Mounting:	5 holes, D = 3.2 mm
-	Temperature range in operation:	0°C ..... 50°C
-	Temperature range in stock:	-25° ..... 75°C

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Measurement data (Optics LYDIA)

- Measuring range: 0.2 mm ..... 28 mm
- Resolution: 0.4375 µm
- Repeat accuracy Edge mode: +/- 10 µm
- Repeat accuracy Dia mode: +/- 20 µm
- Non-linearity Edge mode: +/- 20 µm
- Non-linearity Dia mode: +/- 35 µm
- Reaction time: < 1 ms
- Measuring rate: max. 1000 measurements / s
- Measuring modes: Edge mode, Dia -mode (see Appendix `B´)

Serial Interface:

- Connector: 10-pin. header, RM 2.54, for IDC socket
- Signals: RXD, TXD, GND
- Baud rate: 4800, 9600, 19200, 38400, 57600, 115200 selectable via coding switch
- more Settings: Data bits: 8, parity: without, stop bits: 1,
  Flow control: without

Encoding switch: Switch position: Baud rate:

Switch position	Baud rate
0	4800
1	9600
2	19200
3	38400
4	57600
5	115200
6	F invalid

After changing the switch position, the device must be restarted to recognize the set baud rate.

Pin assignment:

Pin	Signal	Remarks
1	TXD-SENSOR	Output RS232
2	RXD-SENSOR	Input RS232
3	OBJECT-DETECT	Output, open collector, active low
4	TRIGGER-IN	Input 0 / 5V, not activated
5	n.c.	Not connected
6	FRAME	Without function, output, open collector
7	+5V	Output , 5V, for service only
8	n.c.	Not connected
9	+UB	Operating voltage. +10V ... 26V DC max. 200mA
10	GND	0V (GND)

!!! Note !!!

The filter glasses of the sensor are not allowed to be touched . Smallest impurities, as well as fingerprints affect the function. If necessary, clean the glasses with alcohol and a soft, lint-free cloth without residue.

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Appendix `A´ Command – List LaserMicrometer LM28

DATA COMMAND

Hex: <0x1X>, where X specifies amount of requested consecutive data's.
Sensor response: 2^x x DATA, multiple of 3bytes packet, min. 3 bytes.
3 BYTE FORMAT: <HIGH BYTE> >LOW BYTE> >INFO BYTE>
INFO BYTE FORMAT (8 bits): /OBJECT_IN/0/#AVG_VALID/0/0/M2/01/M0/
OBJECT_IN bit: indicates presence of an Object
#AVG_VALID: for higher stability sensor averages several readings, when measuring mode is changed, old reading in the buffer would make false result
M2/M1/M0/: measuring mode, see MODEs table on next page

Example 1:
PC request: <0x10> // request for 1 data
Sensor response: <0xA4> <0xB7> <82> // high byte, low byte, info byte
//Data = 0xA4B7=42167, this is diameter in pixels
//1 pixel = 0.4375 µm. Data (mm) = 42167*0.4375=18.448
//Status byte: Object present, averaging is valid and mode=diameter

Example 2:
PC request: <0x14> // request for 16 consecutive data's
Sensor response: Sixteen 3 bytes packet (for conversion see MODE command below)

DATA_STREAM_START

Hex: <0x21>, continuous DATA stream start, Sensor response: data stream of 3 bytes packets, see DATA command

DATA_STREAM_STOP

Hex: <0x20>, continuous DATA stream stop, Sensor response: no response

MODE command

Hex: <0x3X>, where X specifies the measurement mode.
Sensor response (1 byte): <0x3X> //echo back

This parameter is not stored in the sensor after power OFF. It needs to be set after power ON event.

X	0000b	0001b	0010b
Mode	Edge 1	Edge 2	Dia

Table 2: Mode Table

See also Appendix `B´ for more information on the various measurement modes.

FIRMWARE command

Hex: <0xF0> reads firmware version, Sensor response: two bytes

LASER ON/OFF command

Hex: <0x91> for Laser ON, <0x90> for Laser OFF, Sensor response: command echo

UNLOCK command

Hex: <0xFEF1F9E0>, this command unlocks service commands reserved for skilled user only.
Sensor response (1 byte): <E0>, signal, average, EEPROM access

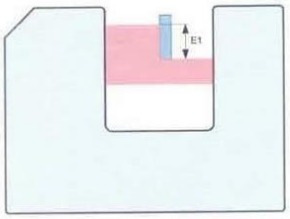
READ RAW DATA command (unlock required)

Hex: <0xD0>, this command reads light intensity profile of CMOS image sensor.
Sensor response: 2137 bytes (2048 bytes image data + other information)

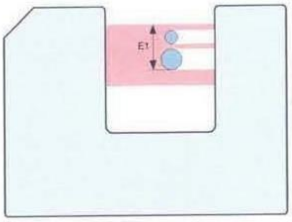
READ THRESHOLD command (unlock required)

Hex: <0xD1>, this command reads threshold data.
Sensor response: 2137 bytes

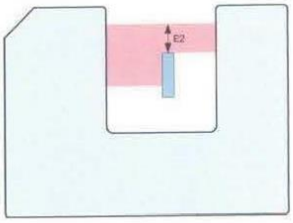
Appendix `B´ Mess – Modi LaserMicrometer LM28



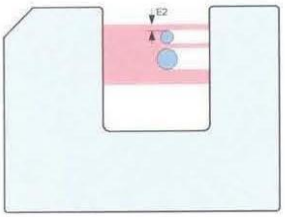
EDGE1 – MODE
LEADING EDGE



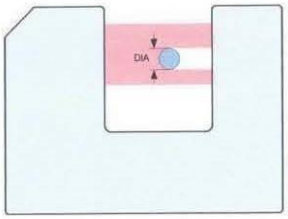
EDGE1 – MODE
MULTIPLE OBJECTS



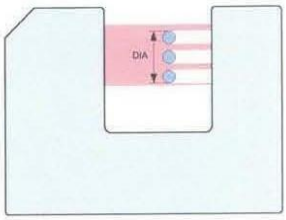
EDGE2 – MODE
TRAILING EDGE



EDGE2 – MODE
MULTIPLE OBJECTS

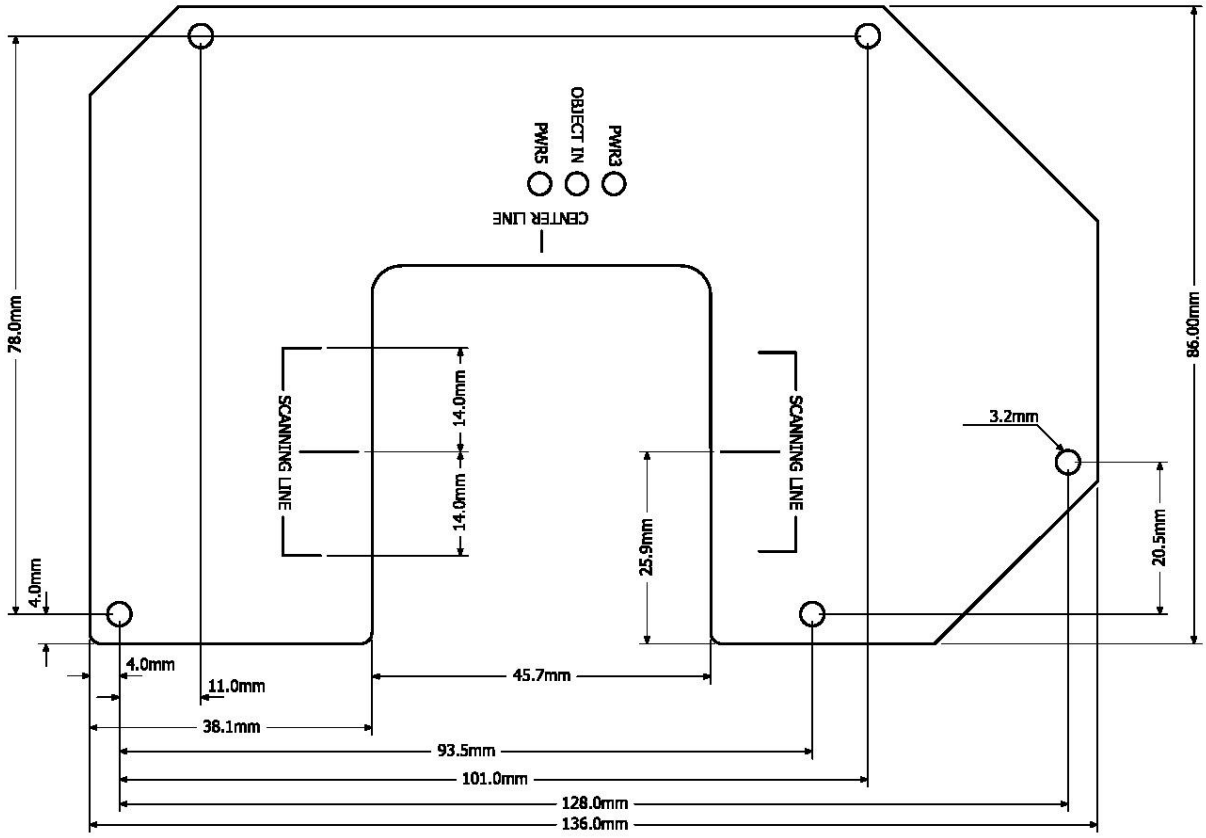


DIA – MODE



DIA – MODE
MULTIPLE OBJECTS

Appendix `C´ Mounting / Dimensions LaserMicrometer LM28



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